Claims

1. Method for recognizing speech,

wherein in a preprocessing section (S2) a step of performing a variance normalization (VN) is applicable to a given or received speech signal (S) and/or to a derivative (S') thereof, said preprocessing section comprising the steps of:

- performing a statistical analysis (S11) of said speech signal (S) and/or of a derivative (S') thereof, thereby generating and/or providing stastistical evaluation data (ED),

- generating and/or providing normalization degree data (ND) from said statistical evaluation data (ED), and

- performing a variance normalization (VN) on said speech signal (S), a derivative (S') and/or on a component thereof in accordance with said normalization degree data (ND) - in particular with a normalization strength corresponding to said normalization degree data (ND) - with normalization degree data having a value or values in a neighbourhood of 0 indicating that no variance normalization (VN) has to be performed.

2. Method according to claim 1,

wherein said statistical analysis (S11) is performed in an at least piecewise or partial frequency-dependent manner.

3. Method according to anyone of the preceding claims,

wherein said evaluation data (ED) and/or said normalization data (ND) are generated so as to reflect at least a piecewise frequency dependency.

4. Method according to anyone of the preceding claims,

wherein said statistical analysis (S11) includes a step of determining signal-to-noise ratio data (SNR) or the like, in particular in a frequency-dependent manner.

5. Method according to anyone of the preceding claims,

wherein a set of discrete normalization degree values (Dj) is used as said normalization degree data (ND), in particular each of which being assigned to a certain frequency interval (fj, Δfj), said intervals (fj, Δfj) having essentially no overlap.

6. Method according to claim 5, wherein each of said discrete normalization degree values (Dj) has a value within the interval of 0 and 1.

7. Method according to anyone of the preceding claims, wherein in each case a normalization degree value (Dj) in the neighbourhood of 0 indicates to skip any variance normalization (VN) for the respective assigned frequency interval (fj, Δfj).

8. Method according to anyone of the preceding claims, wherein in each case a normalization degree value (Dj) in the neighbourhood of 1 indicates to perform a maximum variance normalization (VN) for the respective assigned frequency interval (fj, Δfj).

9. Method according to anyone of the preceding claims, wherein a transfer function between said statistical evaluation data (ED) and said normalization degree data (ND) is used for generating said normalization degree data (ND) from said statistical evaluation data (ED).

10. Method according to claim 9, wherein a piecewise continuous, continuous or continuous differentiable function or the like is used as said transfer function, so as to particularly achieve a smooth and/or differentiable transfer between said statistical evaluation data (ED) and said normalization degree data (ND).

11. Method according to anyone of claims 9 or 10, wherein a theta-function, a sigmoidal function or the like is employed as said transfer function.

12. Method according to anyone of the preceding claims, wherein said variance normalization (S14) is carried out by multiplying said speech signal (S), a derivative (S') and/or a component thereof with a reduction factor (R) being a function of said statistical evaluation data (ED), in particular of the signal noise, and the normalization degree data (ND), in particular of the normalization degree values (Dj) and/or in particular in a frequency-dependent manner.

13. Method according to anyone of the preceding claims, wherein a reduction factor (R) is used having the - in partiuclar frequency-dependent - form

$$R = 1/(1 + (\sigma - 1) \cdot D)$$

with σ denoting the temporal standard deviation of the speech signal (S), its derivative (S'), a component and/or a feature thereof and D denotes the normalization degree value in question.